

AMC2 4W

APC-AMC2-4W | APC-AMC2-4WCF | APC-AMC2-4WUS



BOSCH

en Installation manual

Remarks

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1 Please-read carefully

1.1 Explanation of Used Symbols

Throughout this document, helpful tips, important notes, cautions and warnings will be presented for the reader to keep in mind. These appear different from the rest of the text as follows:



CAUTION! or WARNING!

These warn the operator that damage to the program or equipment might occur.



NOTE!

Important Notes — must be followed for successful operation and programming. Tips and shortcuts might also be included here.

1.2 Internet

If you are interested in further information on this product or information on other products, please, refer to our website at <http://www.bosch-security-systems.com>.

2 Safety Instructions

2.1 Important Safety Notes

1. **Read, Follow, and Retain Instructions** - All safety and operating instructions must be read and followed properly before putting the unit into operation. Retain instructions for future reference.
2. **Consider all Warnings** - Adhere to all warnings on the unit and in the operating instructions.
3. **Accessories** - Use only accessories recommended by the manufacturer or those sold with the product. Accessories not recommended by the manufacturer shall not be used, as they may cause hazards.
4. **Installation Precautions** - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to persons and damage to the unit. Mount the unit according to the manufacturer's instructions.
5. **Service** - Do not attempt to service this unit by yourself. Opening or removing covers may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.
6. **Damage Requiring Service** - Disconnect the unit from the main AC or DC power source and refer servicing to qualified service personnel under the following conditions:
 - When the power supply cord or plug is damaged.
 - If liquid has been spilled or an object has fallen into the unit.
 - If the unit has been exposed to water and/or inclement weather (rain, snow, etc.).
 - If the unit does not operate normally, when following the operating instructions. Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may result in damage, and require extensive work by a qualified technician to restore the unit to normal operation.

- If the unit has been dropped or the cabinet damaged.
 - If the unit exhibits a distinct change in performance, this indicates that service is needed.
7. **Replacement Parts** - When replacement parts are required, the service technician shall use replacement parts that are specified by the manufacturer. Unauthorized substitutions may result in fire, electrical shock or other hazards.
 8. **Safety Check** - Upon completion of service or repair work on the unit, ask the service technician to perform safety checks to ensure that the unit operates properly
 9. **Power Sources** - Operate the unit only from the type of power source indicated on the label. If unsure of the type of power supply to use, contact your dealer
 - For units intended to operate from battery power, refer to the operating instructions.
 - For units intended to operate with External Power Supplies, use only the recommended approved power supplies.
 - For units intended to operate with a limited power source, this power source must comply with EN/UL 60950. Substitutions may damage the unit or cause fire or shock.
 - For units intended to operate at 12/24V DC normal input voltage is 12/24V DC. Voltages applied to the unit's power input shall not exceed 15/30V DC.
 10. **Lightning** - For added protection during a lightning storm, or when this unit is left unused for long periods of time, disconnect the unit from power. This will prevent damage to the unit due to lightning and excessive power line surges.
 11. **Restricted Access Locations** are required for the installation.

2.2 FCC & ICES Information

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. The limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate receiving antenna
2. Increase the separation between the equipment and the receiver
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
4. Consult the dealer or an experienced radio/TV technician for help

2.3 Safety Precautions



Read instructions!

Before working with the AMC2 4W, read these instructions carefully. Make sure you have understood all information described in this document.



Warning! Risk of electric shock!

External power supplies must be installed and put into service by qualified personnel. Compliance with the relevant regulations must be ensured.



Warning! Risk of damaging equipment!

- Always switch off power of the AMC2 4W before modifying the installation.
- Do not connect or disconnect plug connectors, data cables or screw connectors while power is on!



Health and Safety

Installation of the AMC2 4W must comply with any local fire, health and safety regulations. A secured door that may be part of an escape route from an area must be installed with:

- A fail-safe lock. So that the door will be released if power fails. Ideally, a magnetic lock should be used as these are less likely to jam or seize.
- A normally-closed break-glass or manual pull in the lock supply wiring, so that in an emergency the fail-safe lock can be immediately powered down.

**CAUTION!**

Disconnect both AC and battery power supply before working on the controller.

**Warning! Risk of damage!**

Protect the hardware from electrostatic discharge by observing ESD instructions before unpacking or touching connectors or electronics.

**CAUTION: Lithium Battery**

Danger of explosion if battery is replaced incorrectly. Replace only with the same type as recommended by the manufacturer. Dispose used batteries according to the battery manufacturer's instructions.

2.4 Unpacking

Check the packaging for visual damage. If anything has been damaged during transport, make the transport agency aware of this.

Carefully unpack the unit. This is an electronic device that must be handled with care to avoid damage. Do not attempt to put the unit into operation if components are damaged.

If parts are missing, inform your customer service representative or a Bosch Security Systems salesperson. The shipping carton is the safest transport container for the unit. Store it and the other packaging material for future use. If the unit has to be sent back, use the original packaging.

3 Introduction

3.1 Description of the AMC2 4W

The AMC2 4W is equipped with four independent interfaces for Wiegand type readers. By that it is able to control two doors with a reader in each direction and up to four doors with a reader in one direction only.

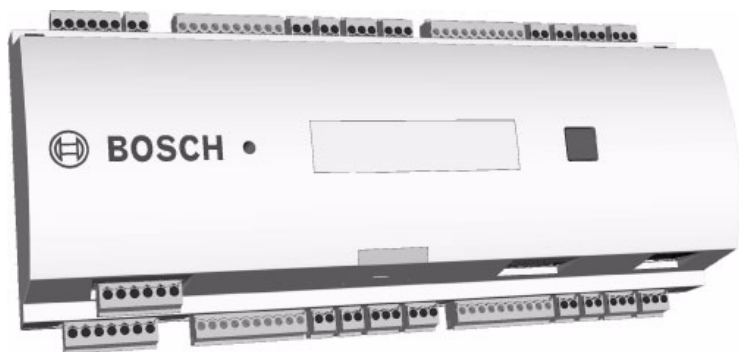


Fig. 3.1 The Access Modular Controller AMC2 4W

All necessary information for access verification is stored in a battery buffered on-board memory and a Compact Flash (CF) memory card. This guarantees autonomous access decisions and complete access registrations even if the management host system is offline. The built in compact flash adapter provides adequate storage capability for cardholders and events.

The AMC2 4W electronic is completely covered by a plastic housing. The LC Display provides all important status information.

Using the AMC2 4W gives you the full functionality and the offline capability of a complete access control system on each room. This leads to an excellent reliability and a very high redundancy without paying extra money.

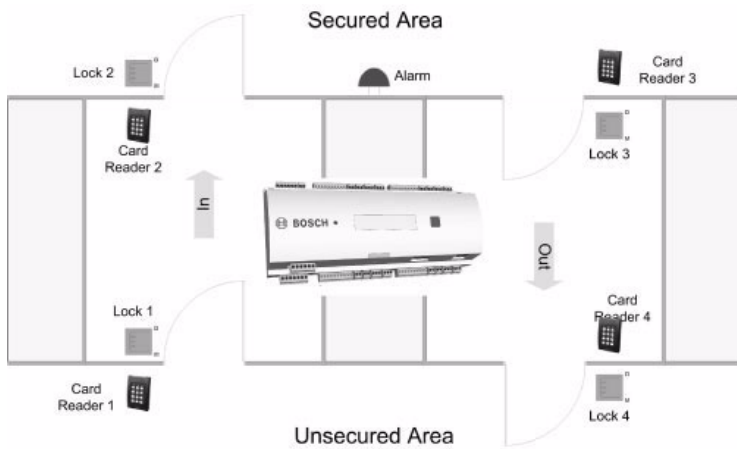


Fig. 3.2 The AMC2 4W in a four door safety lock

The AMC2 4W can communicate upstream to the host computer via eight RS-485 multi-dropped, RS-232 or 10/100 Mbit/s Ethernet. It has eight analog input devices and eight relay outputs. With its analog input devices, the AMC2 4W verifies, for example, if a lock is closed or open. The relay outputs can be used to activate lock mechanisms if access is granted, or activate an external alarm system if an intrusion or system alert is detected. If the eight input and output on board are not enough to configure the system up to three additional extensions (AMC2 8I-8O-EXT or AMC2 16I-16O-EXT) can be connected. The extensions offer 8 or 16 additional inputs and outputs. The setup procedure for an AMC2 4W is very simple and extremely fast by the use of door templates. Once selected, all the inputs and outputs are predefined. This settings can be changed using the Device Editor of the BIS Configuration Browser in that way to choose every free contact of the AMC2 4W or an connected extension.

3.2 Equipment Configuration

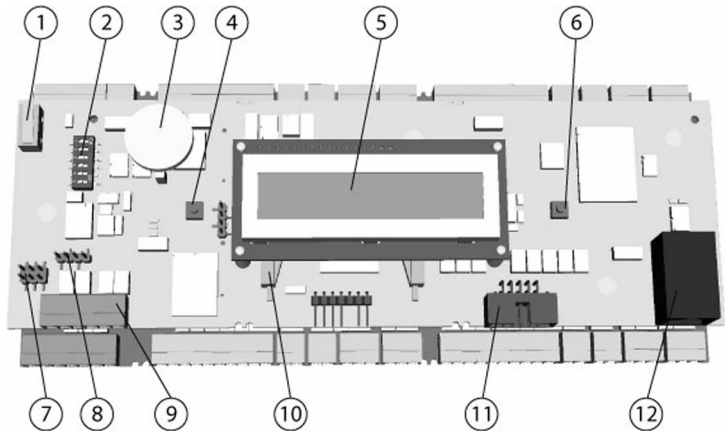


Fig. 3.3 Upper circuit board with display (top side)

1. Internal tamper contact
2. DIL switch for RS-485 address selection, protocol and RS-232/RS-485 selection
3. Lithium battery for buffering of static RAM and real time clock (RTC). The battery shall be replaced by qualified personnel every ten years or if indicated by an appropriate event.
4. Reset push button - available by using the screw driver
5. LC Display
6. Push button to select the display view - available by using the push button on the top of the housing
7. Jumper: Potential equalization between different mass systems and protective earth (shield)
8. Jumper: interface selector RS-485 Host connection, RS-485 two wire or RS-485 four wire (depends on external wiring)
9. Configurable RS-485 host interface (pluggable screw connector)
10. Docking station for the compact flash

11. Configurable RS-232 host interface (ribbon cable connector)
12. Configurable 10/100 Mbit/s Ethernet interface

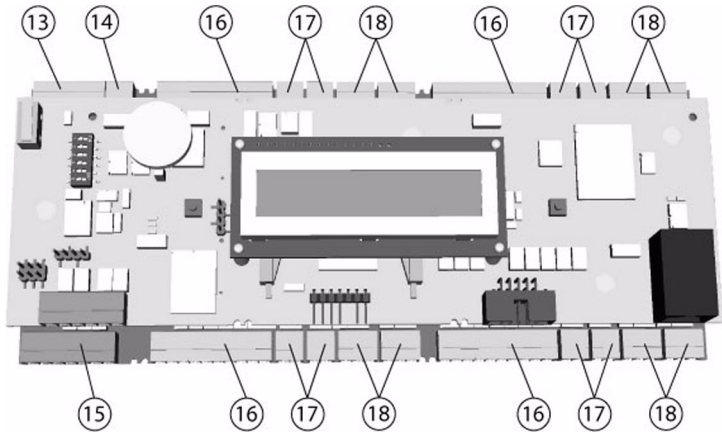


Fig. 3.4 Overview - Interfaces

13. RS-485 extension module bus (Pluggable screw connector)
14. External tamper contact (Pluggable screw connector)
15. Power supply (Pluggable screw connector)
16. Wiegand interfaces for up to 4 card readers (Pluggable screw connector)
17. Connectors for eight analog inputs (Pluggable screw connector)
18. Connectors for eight relay outputs (Pluggable screw connector)

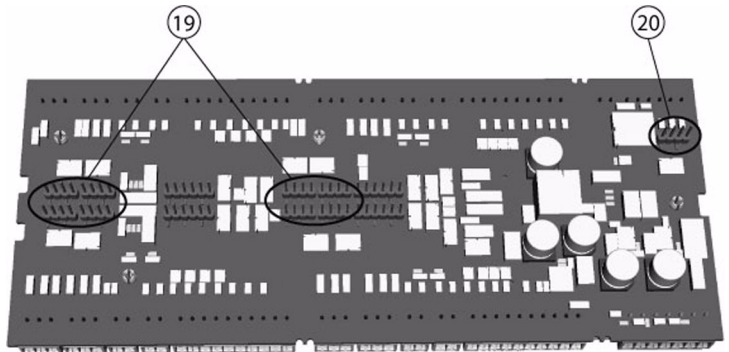


Fig. 3.5 Jumper at the bottom side

19. Jumper: Selector for either potential free relay output or powered by AMC2 4W internal power supply (wet/dry contacts).
20. Jumper: Potential equalization between different mass systems and protective earth (shield) for the extension interface.

3.3 Performance Characteristics

- Intelligent access manager for 1 ... 4 entrances (e.g. doors, man traps, barriers)
- Host address selectable via DIL sliding switch
- Four possible configurable host interfaces:
 - RS-485 2-wire
 - RS-485 4-wire
 - RS-232
 - Ethernet
- Four peripheral input devices via Wiegand interface
- Eight relay outputs
 - potential-free or
 - with internal power supply
- Eight analog inputs with internal power supply
- Battery buffered SRAM and real time clock (RTC)
- Pluggable Compact Flash from 64 MB to 1024 MB
- LC Display
- Transfer rate host interface RS-485: 38,4 kBit/s
- Transfer rate host interface RS-232: 38,4 kBit/s
- Transfer rate host interface Ethernet: 10/100 Mbit/s
- Self controlling transfer-receive-switching
- Power supply for internal electronics: 10V - 30VDC - max. 5A
- Tamper contact for internal and external covers
- The AMC2 4W is to be used with power supply AMC PBC-60 (F.01U.026.573) with integrated UPS.

3.4 System Overview

The Access Controller AMC2 4W is connected between the management host system and different peripheral devices. By default a management host system is connected via Ethernet. A management host connection via RS-485 or RS-232 is also possible.

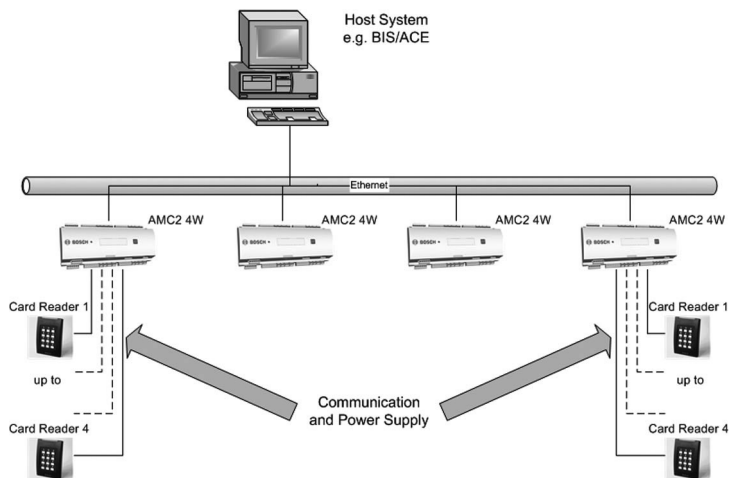


Fig. 3.6 System overview

The number of controllers in one system is limited to 200. Corresponding to the available interfaces one AMC can be connected to each COM-Port using RS-232 mode. In RS-485 mode up to eight access controllers can be combined on one party line.

Via Wiegand interfaces up to four peripheral devices can be connected to each AMC2 4W. The interfaces are point-to-point connections - this means that only one reader can be connected to one interface.

4 Technical Data

Hardware	<ul style="list-style-type: none">- Integrated Microcontroller (32Bit, 30MHz)- SRAM (256MB)- Serial EEPROM- RTC- Pluggable Compact Flash from 64 MB up to 1024 MB- Battery for SRAM and real time clock (RTC)- Host address selectable via DIL sliding switch or software- Host interface<ul style="list-style-type: none">• RS-485 2-wire or 4-wire Transfer rate: 38,4 kBit/s (No parity, 8 Bit, 1 Stopbit)• RS-232 Transfer rate: 38,4 kBit/s (No parity, 8 Bit, 1 Stopbit)• Ethernet 10/100 Mbit/s- Four Wiegand interfaces for card readers<ul style="list-style-type: none">•- Eight relay outputs<ul style="list-style-type: none">• max. switching power: 37,5VA• max. switching voltage: 30V DC• max. switching current: 1,25A- Eight analog inputs with sabotage monitoring- Tamper contact for enclosures
Power supply	AMC: 10V – 30V DC
Display	64,8 mm x 13,9 mm (2.551 x 0.547 in.) 1 line, 16 characters

Power consumption	AMC: 5VA Peripheral devices: using the AMC PBC-60 <ul style="list-style-type: none">- up to 55VA- constant load: 25VA
Connectors	Pluggable screw connectors
Protection Class	IP30
Environment temperature	0°C to 45°C
Humidity	Up to 95%, without condensation
Housing material	ABS with OC (UL 94 V-0)
Dimensions	(W/H/D) 232mm x 90mm x 63mm (8.9 x 3.5 x 2.4 in.)
Weight	app. 0,53 kg (0.9 pounds)

**CAUTION!**

The voltage drop from the power supply to the AMC has effect on the AMC-Interfaces. Their sum shall be less than 2V!

5 Installing

5.1 Mounting

The AMC2 4W can be attached on a standard 35 mm (1.377 in.) mounting rail via a snap-in mechanism. Attach the AMC2 4W into the upper edge of the mounting rail, then push down the AMC2 4W and snap it onto the rail by pushing it towards the back.

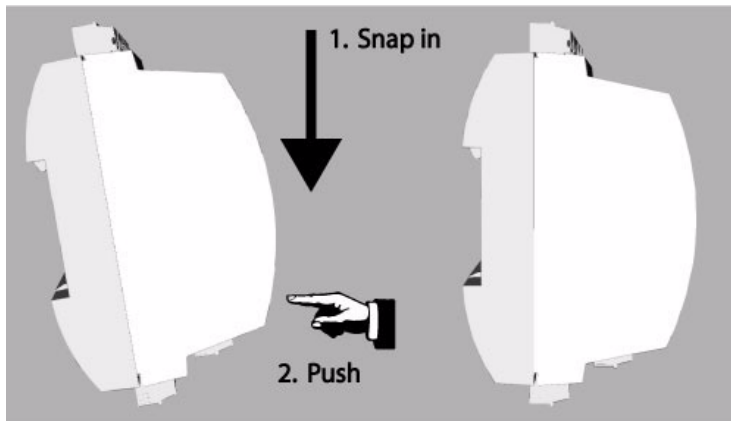


Fig. 5.1 Mounting the AMC2 4W on a mounting rail

5.2 Demounting

**NOTE!**

To remove the AMC2 4W from a mounting rail, first, remove all pluggable screw connectors.

Push down the AMC2 4W until it snaps out of the mounting rail.
Pull the lower end of the AMC2 4W from the mounting rail.

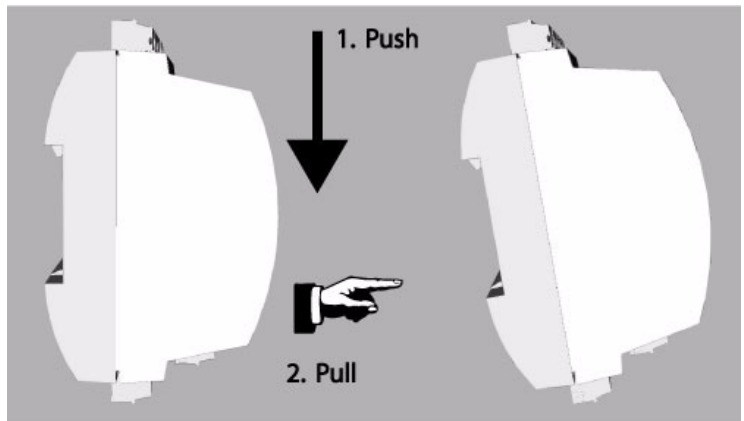


Fig. 5.2 Demounting the AMC2 4W from a mounting rail

5.3 Opening the AMC2 4W Case

**NOTE!**

To open the AMC2 4W, first, remove all pluggable screw connectors at least the host connection.

The AMC2 4W case consists of a top cover mounted with a two-point snap-in closure on a ground chassis. To open the AMC2 4W push down the two snap-ins with a screw driver. After that the cover can be moved to bottom.

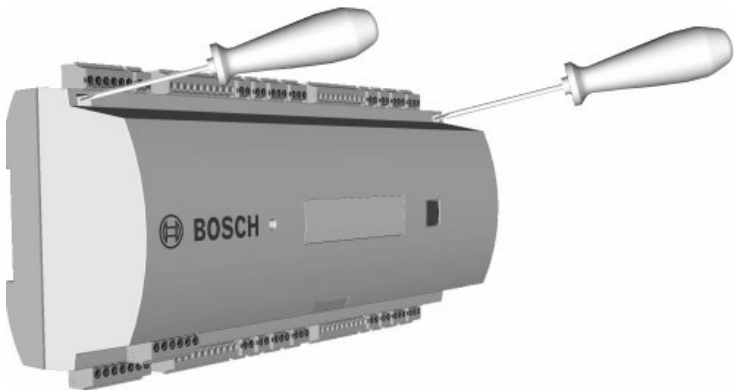


Fig. 5.3 Opening the AMC2 4W case

5.4 Cabling



CAUTION!

The cables used in the AMC2 4W access control system are not prone to electrical interference. However, you should avoid routing cables close to heavy load switching cables and equipment. If this is unavoidable, cross the cable at right angles every 1 to 2 m (3 to 6 ft) to reduce interference.

Grounding and Shielding

The main grounding point at the AMC2 4W will be connected with pin 2 of the power supply connector - see *Figure 7.6*. It is good practice to shield all wires carrying low level signals.

The AMC2 4W enables you to set up a central ground or shielding point, simply by setting a couple of jumpers. Set these jumpers only if ground or shield is not connected otherwise.



WARNING!

Risk of damaging equipment!
When using multiple AMC2 4W devices, set the ground main jumper only once to assure a central point star connection.

5.4.1 Conductor data for connection to power supply

For short distances below 25m (75 feet) use AWG18 conductors. For higher distances install an additional power supply close to the AMC.

Please, calculate the voltage drop by checking the conductor specifications for characteristic resistance values. The voltage drop shall not exceed 2V.

Example:

Length = 100m/328 ft

$U = 12V, I = 1A, \text{ maximum } V_{\text{Drop}} = 2V$

i.e. $R_{\text{AWG18}} \text{ (acc. specs)} = 6,385 \frac{\Omega}{1000 \text{ ft}}$ or $20,948 \frac{\Omega}{\text{km}}$

$V_{\text{Drop}} = 20,948 \frac{\Omega}{\text{km}} \times 0.1 \text{ km} \times 1A = \underline{\underline{2.1V}}$

$V_{\text{Drop}} = 6,385 \frac{\Omega}{1000 \text{ ft}} \times 328 \text{ ft} \times 1A = \underline{\underline{2.1V}}$

Critical condition! Install the power supply closer to the controller.



NOTE!

These specifications aim for readers, relay outputs, and extensions.

For inputs there are other value to keep in mind - see therefore *Table 5.3*.

5.4.2 Grounding and Shielding the Host Interface

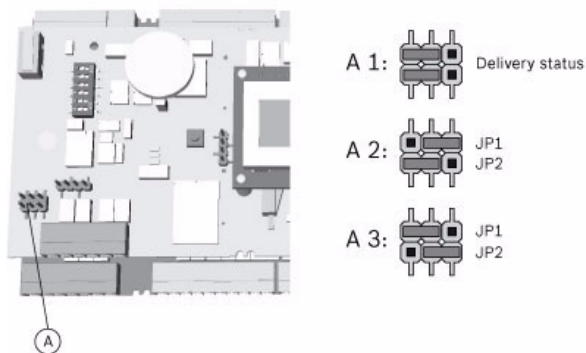


Fig. 5.4 Location of ground jumper RS-485 host interface

The jumper setting A1 shows the delivery status.

**NOTE!**

Generally the following counts:

- If the devices have an own power supply, the shield will be connected on one point, only.
The free end should be protected to avoid connections.
- If the device will be provided by an other one, the shield have to connect on both sides.

WARNING!

Take care that there are no grounding loops.

Setting jumper JP1 connects the internal ground of the AMC2 4W to the ground of the RS-485 host interface. Jumper JP2 manages the PAG.

Settings jumper JP1:

If the ground conductor and the shield on the host are not connected and ...

- no partyline exists, the jumper JP1 is set (= A2)
- a partyline exists, ...
 - the jumper JP1 is set at the first device, only (= A2)

Settings jumper JP2:

If the ground conductor and the shield on the host are not connected and ...

- no partyline exists, the jumper JP2 is set (= A3)
- a partyline exists and PAG is connected, ...
 - the jumper JP2 is set at the first device, only (= A3)
- a partyline exists and PAG is not connected, ...
 - the jumper JP2 is set at all devices (= A3)

**NOTE!**

If the AMC2 4W is set to RS-232 mode, Jumper JP1 (= A2) must be set.

5.4.3 Grounding and Shielding the Extension Interface

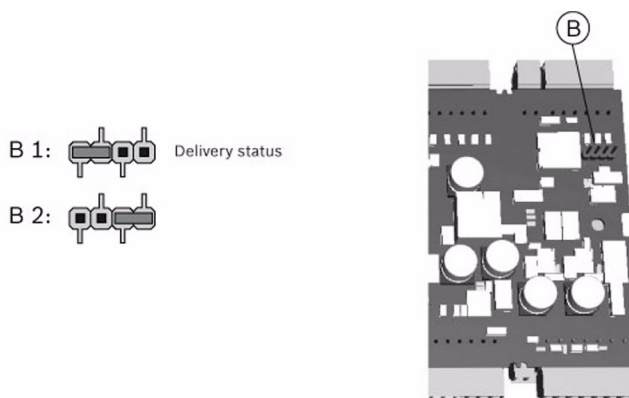


Fig. 5.5 Location of ground jumper bottom side

Jumper B connects the internal ground of the AMC2 4W to the RS-485 ground of the slave interface. Jumper B shall only be set (B2) if the AMC2 4W powers all other peripheral devices which are directly connected to the AMC2 4W.

5.5 Connecting Power Supply

Connect the power supply to the 7-pin pluggable screw connector labeled with POWER on the upper case.



NOTE!

A complete connection diagram of the power supply connector is shown in *Figure 7.6*.

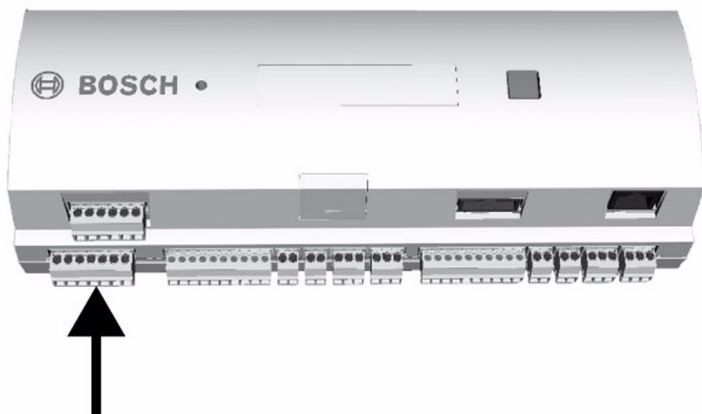


Fig. 5.6 Location of the power supply connector

An external power supply (10 - 30V DC) must be connected for internal electronics at pin 1 (positive) and pin 3 (negative) of the pluggable screw connector.

When using a shared 12V DC power supply for internal electronics and peripherals, pin 1 and pin 6 resp. pin 3 and pin 7 can be shortened.

If an uninterruptible power supply (UPS) is used, the relay output for power good signals from the UPS is connected to the following pins:

- pin 4 and 7 for power good AC
- pin 5 and 7 for power good Battery
- pin 6 and 7 for power good DC

Otherwise these pins must be short-circuited.

5.6 RS-485 Host Interface

An RS-485 host system can consist of up to eight AMC2 4W controllers connected via 2- or 4-wire connection.

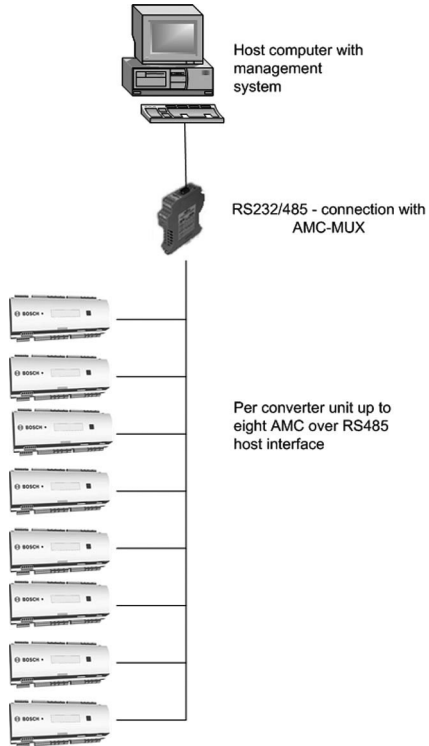


Fig. 5.7 Configuration of a RS-485 host system

The following conditions apply for an RS-485 bus system:

- A bus system consists of a bus line and/or one or more branch lines.
- Cable lengths exceeding 100m or 300ft must be installed as bus lines.
- Branch lines are branching connections from a bus line.
- Peripheral devices are AMC2 4W which are connected to the host computer.
- Maximum cable length of a bus line must not exceed 1200m or 4000ft.
- The cable length of branch lines must not exceed 100m or 300ft.
- Any bus line conductor connects up to eight AMC2 4W. The maximum number of devices must not be exceeded.
- For longer bus lines connect the AMC2 4W to multiple AMC-MUX (-EXT) with the host.



NOTE!

Up to seven AMC-MUX-EXT can be connected to an AMC-MUX. Every module subjects the conditions above. Using the extensions you can't connect more than eight AMC2 4W.

To get more information about the AMC-MUX and the extension see the manual of these devices (F.01U.012.855).

To use RS-485 mode at the AMC2 4W, connect the data cables to the pluggable screw connector of the RS-485 host interface. Set the connection mode of the RS-485 using the DIL switch of the AMC-MUX. Then set the RS-485 address via DIL switch or software and activate the RS-485 two-wire or four-wire mode via jumper settings on the AMC - see *Figure 5.10* and *Figure 5.12*.

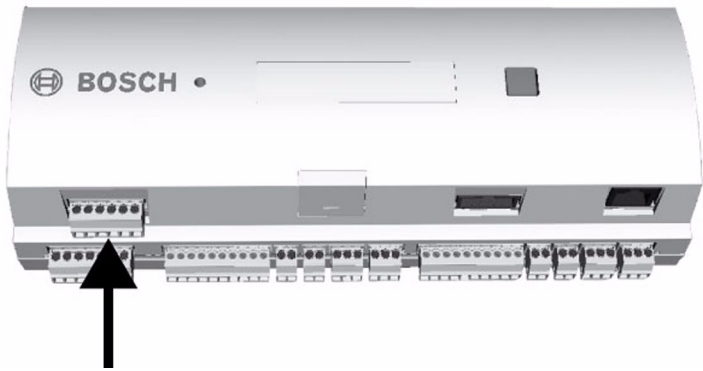


Fig. 5.8 RS-485 host interface

5.6.1 RS-485 Two Wire Connection

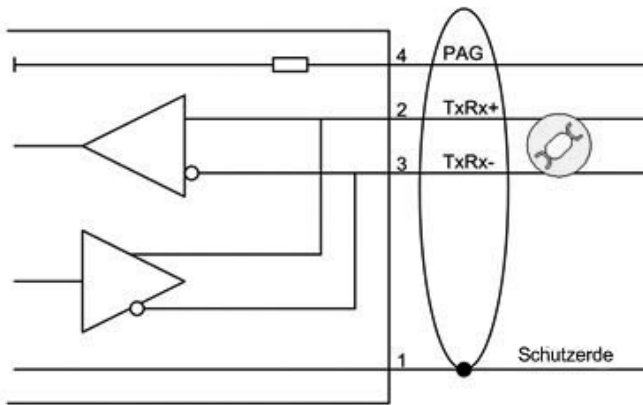


Fig. 5.9 Connection scheme of a RS-485 two wire connection

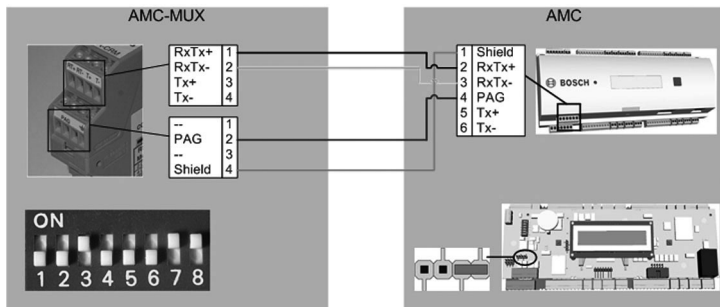


Fig. 5.10 Settings for RS-485 two wire connections

For RS-485 two wire connection set the AMC-MUX DIL-Switch at the position **3**, **7** and **8** to **ON**. On the upper side of the AMC panel put the jumper on the two pins on the right hand side of the connector **8** (see also: *Figure 3.3*). Set the RS-485 address of the AMC using the DIL-Switch - see *Section 5.6.3 DIL Switch Address Selector*.

5.6.2 RS-485 Four Wire Connection

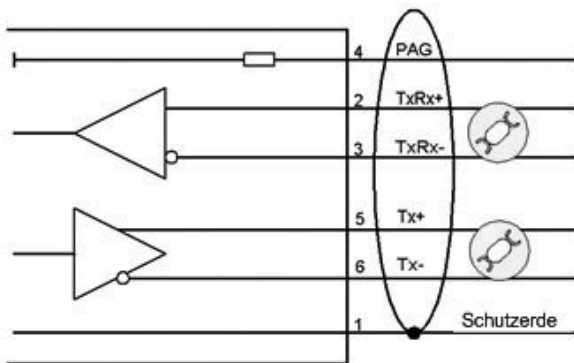


Fig. 5.11 Connection scheme of an RS-485 four wire connection

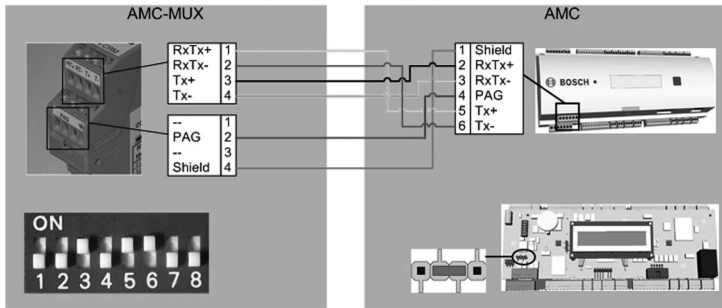


Fig. 5.12 Settings for RS-485 four wire connection

For RS-485 four wire connection set the AMC-MUX DIL-Switch at the position **3**, **5** and **6** to **ON**. On the upper side of the AMC panel put the jumper on the two pins on the right hand side of the connector **8** (see also: *Figure 3.3*). Set the RS-485 address of the AMC using the DIL-Switch - see *Section 5.6.3 DIL Switch Address Selector*.



NOTE!

A complete connection diagram of the RS-485 host interface is shown in *Figure 7.2*.

5.6.3 DIL Switch Address Selector

The first four DIL switches for address selection define the RS-485 address of the AMC2 4Win a RS-485 bus system. Switch **5** selects on of the two different protocols, SDEB and BPA (according to DIN6619). Switch **6** sets the connection to the host system to either RS-232 or RS-485.

**NOTE!**

Using Ethernet connection it is recommended to set switch **1** to **ON** (= delivery status)

Using RS-232 connection the address must be set, which is configured in the Device Editor. Therefore this is a point-to-point connection the usually configured address will be 1 - so the switch **1** must be also set to **ON**.

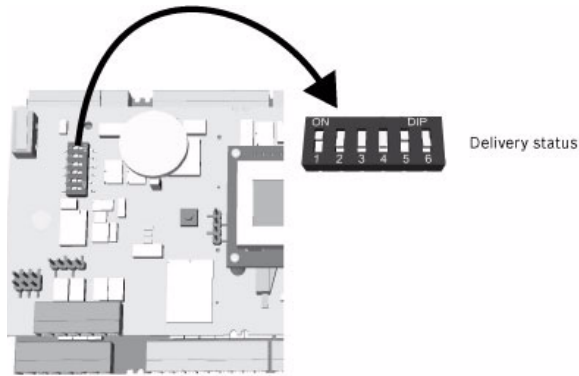


Fig. 5.13 Location of the RS-485 address selector

Address	DIL Switches			
	1	2	3	4
none	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON

Table 5.1 Setting the RS-485 address with the DIL switch

Mode	DIL Switches	
	5	6
ON	SDEB	RS-232
OFF	BPA	RS-485

Table 5.2 Protocol and connection settings

5.7 RS-232 Host Interface

The AMC2 4W offers an RS-232 serial interface to connect a host computer or serial modem.



CAUTION!

Cable length between two RS-232 COM serial interfaces must not exceed 15 meters (45 ft).

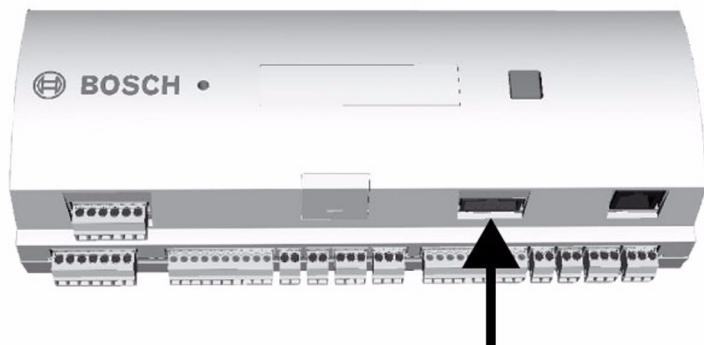


Fig. 5.14 Location of the RS-232 serial interface

The AMC is created like a PC, so you cannot build a 1:1 connection, but cross the data wires using a null modem cable for example.



NOTE!

A complete connection diagram of the RS-232 host interface is shown in *Figure 7.3*.

5.8 Ethernet Interface

The AMC2 4W offers an additional 10/100 Mbit/s Ethernet auto-sensing interface to connect to a local area network or host computer.



CAUTION!

Use either a CAT5 crossover cable to connect the AMC2 4W directly to a computer's network interface or a standard CAT5 patch cable to connect the AMC2 4W to a network hub or network switch.

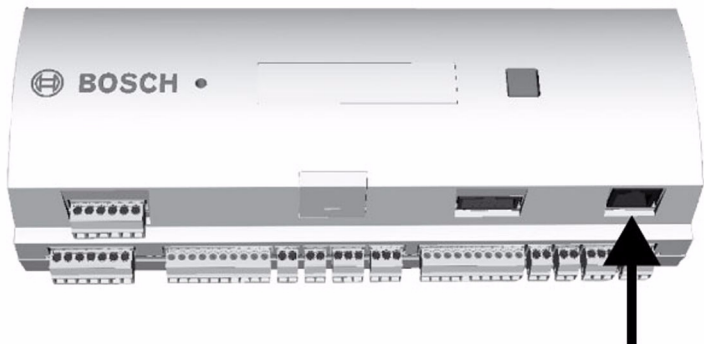


Fig. 5.15 Location of the Ethernet interface

NOTE!

After the connection of a new AMC in a network using DHCP it can take several time if the AMC is known on the remote server. This cause in the DNS cache of the lokal PC - it will be refreshed only after special duration.

To speed up this procedure give in the following command in a command prompt:

```
ipconfig /flushdns
```

After this the AMC should be available by its name.



NOTE!

A complete connection diagram of the Ethernet host interface is shown in *Figure 7.4*.



5.9 RS-485 Extension Module Bus

The RS-485 Extension Module Bus expands the AMC2 4W with additional I/O modules (AMC2 8I-8O-EXT or AMC2 16I-16O-EXT). Up to three expansion modules can be connected to provide additional in- and outputs, for example, for elevator control.

You can find further information about the extension boards in the installation manual of these modules (Order-no: F.01U.024.967)

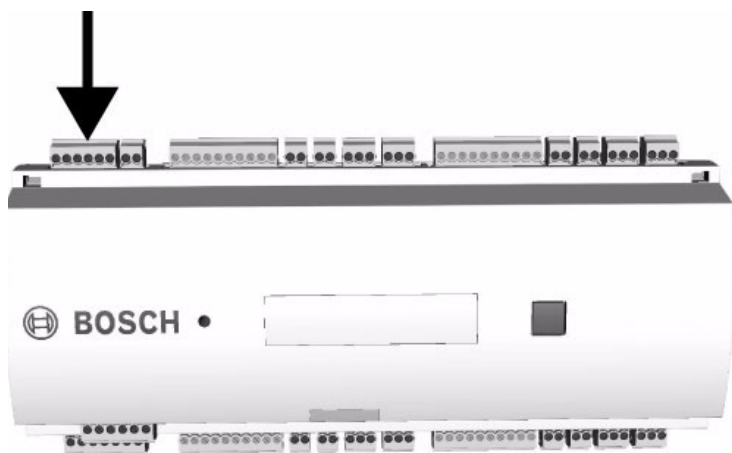


Fig. 5.16 Location of the RS-485 extension module bus



NOTE!

A complete connection diagram of the RS-485 extension module bus is shown in *Figure 7.10*.

5.10 Wiegand Interface for Card Readers

The AMC2 4W has four Wiegand interfaces to integrate up to four card readers with Wiegand compatible interfaces. Each

interface is connected via a 10-pin pluggable screw connector (S2, S7, S14, and S19).

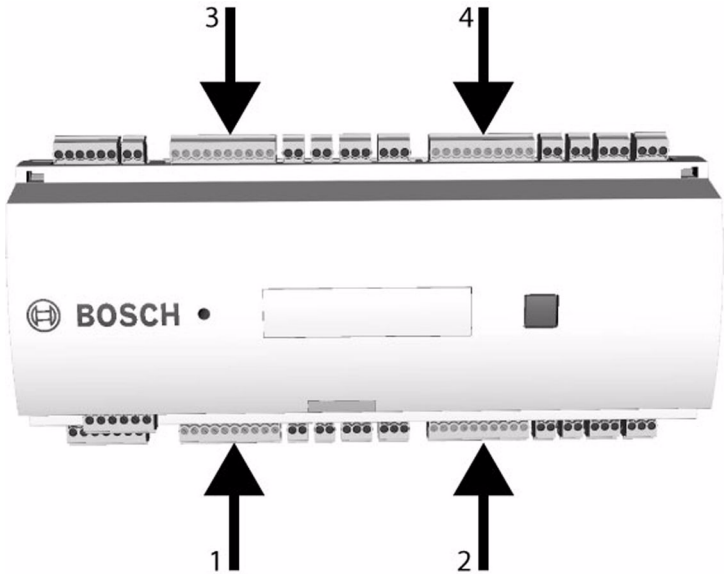


Fig. 5.17 Location of the Wiegand interfaces for external devices

The interfaces are point-to-point connections. You can connect only one reader to an interface - the cable length is limited to 150 m (492 ft). Like the numbering of the interfaces the reader get their address.



NOTE!

A complete connection diagram of the Wiegand interface is shown in *Figure 7.7*.

5.11 Connecting Relay Outputs

To operate locks or alarm systems the AMC2 4W has eight form C relay outputs. The outputs will be connected to the 3-pin pluggable screw connectors: S5, S6, S10, S11, S17, S18, S22, and S23 - see *Figure 7.5*.

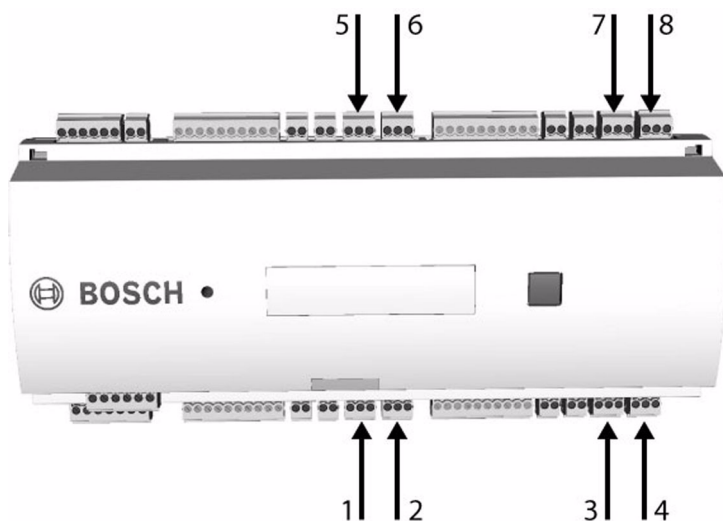


Fig. 5.18 Location of the relay output connectors

Each relay output can operate in 'wet' mode, using the AMC2 4W's internal 12V DC power supply for external devices or 'dry' mode with potential free contacts for externally powered systems.

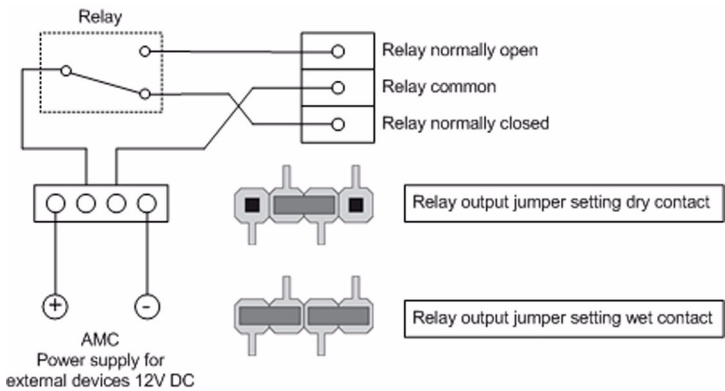


Fig. 5.19 Wet mode and dry mode of the AMC2 4W relay outputs



WARNING!

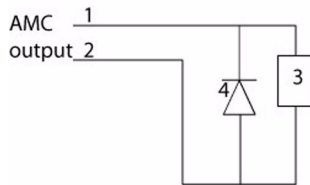
Keep in mind the following specifications.

For the protection of damage the relay keep in mind, that ...

- the maximum switching current is 1,25A
- the maximum switching voltage is 30V DC
- ohm resistive load can be connected to the relay, only
- inductive loads have to be short circuited using recovery diodes - see: *Figure 5.20*. These diodes (BAX12A) are supplied with every AMC2 4W package.
- If you need higher voltage for special constructions you can connect external relays to the outputs. Recommended, depending on the power supply mode, are the relay types of the company Wieland:
 - Flare move 12DC1W10A
 - Flare move 24DC1W16A

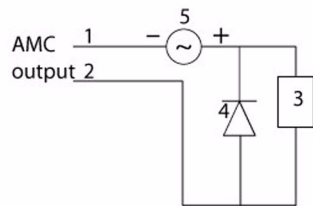
But you can also use products of manufacturer in your country - take care that the values of the product are identical with the products listed above.

wet mode:



1 = normally open/normally closed
 2 = common
 3 = load
 4 = diode

dry mode:



1 = normally open/normally closed
 2 = common
 3 = load
 4 = diode
 5 = voltage source

Fig. 5.20 Schema of the using of the recovery diode



Risk of Damage!

Do not connect externally powered devices in wet mode. This can damage the AMC2 4W.



NOTE!

A complete connection diagram of the relay output connectors is shown in *Figure 7.9*.

Each relay output has a separate jumper setting on the bottom side of the lower circuit board to activate wet (D2) or dry (D1) mode.

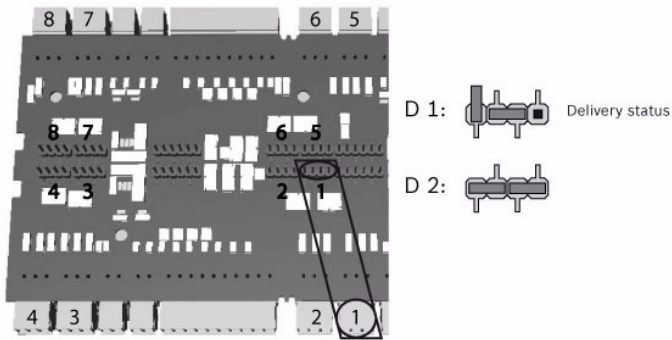


Fig. 5.21 Location of relay output jumpers (bottom side)

5.12 Connecting Analog Input Devices

The AMC2 4W has eight analog inputs, for example, for potential free lock mechanisms or to detect if a lock is closed or open. The inputs will be connected to the 2-pin pluggable screw connectors: S3, S4, S8, S9, S15, S16, S20, and S21 - see *Figure 7.5*.

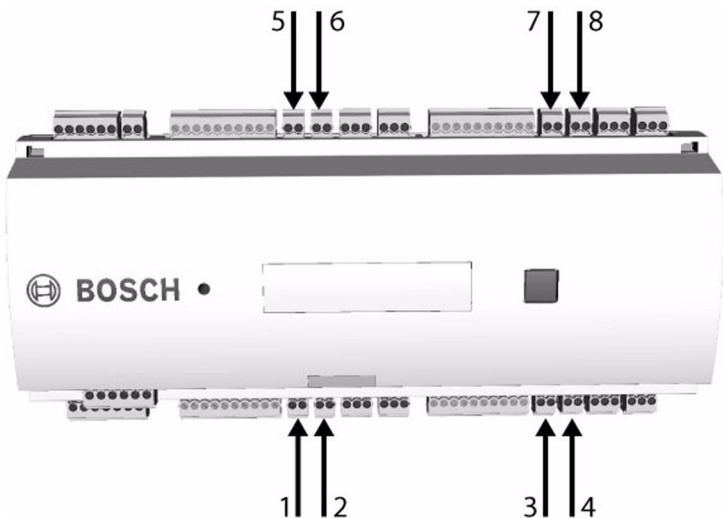
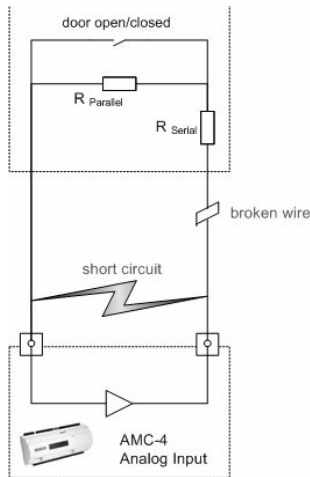


Fig. 5.22 Location of the analog input connectors

The AMC2 4W can also detect the wiring conditions ‘short circuit’ and ‘broken’ and initiate an alarm if the appropriate devices are connected.



1. Door open: $R_S + R_P$
2. Door closed: R_S
3. Broken wire: $R_S + R_P =$
4. Short circuit: $R_S + R_P = 0$

The resistor values can vary and depend on the used lock system (wire resistance negligible).

The AMC2 4W package includes 2,2 k Ω resistors using for reserves for the R_S and the R_P resistor.

Fig. 5.23 Operating modes of a lock

using the analog input device



NOTE!

A complete connection diagram of the analog input devices is shown in *Figure 7.8*.

To detect the four states there are only special values allowed for potential drop depending on the used resistors. The following table shows the values for the possible resistor combinations.

R _p	1k	1k2	1k5	2k2	2k7	3k3	3k9	4k7	5k6	6k8	8k2
R _s											
1k	0,21	0,23	0,26	0,32							
1k2	0,20	0,23	0,26	0,32	0,35						
1k5	0,20	0,23	0,25	0,32	0,35	0,39	0,41				
1k8	0,19	0,21	0,24	0,31	0,34	0,38	0,41	0,44	0,47	0,50	
2k2		0,20	0,23	0,30	0,33	0,37	0,40	0,43	0,47	0,50	0,53
2k7		0,18	0,21	0,27	0,31	0,35	0,38	0,41	0,45	0,49	0,51
3k3			0,19	0,24	0,28	0,32	0,35	0,39	0,42	0,46	0,50
3k9				0,23	0,26	0,29	0,32	0,36	0,40	0,43	0,47
4k7				0,20	0,23	0,26	0,29	0,32	0,35	0,39	0,42
5k6					0,20	0,23	0,25	0,29	0,32	0,35	0,39
6k8						0,19	0,22	0,24	0,27	0,31	0,33
8k2							0,18	0,21	0,23	0,26	0,29

Table 5.3 Maximum values of potential drop for the combination of resistors



NOTE!

It is recommended to choose the serial resistor (R_S) not higher than 5K6 to get clearly values.

5.13 Tamper Protection

To protect the AMC2 4W against unauthorized access and prevent the AMC2 4W from tampering with sensitive data, the AMC2 4W offers an additional interface to connect external tamper contacts. This interface is a potential-free 2-pin pluggable screw connector marked with **T**. If not using the tamper contact, short-circuit the contacts with a wire connection.

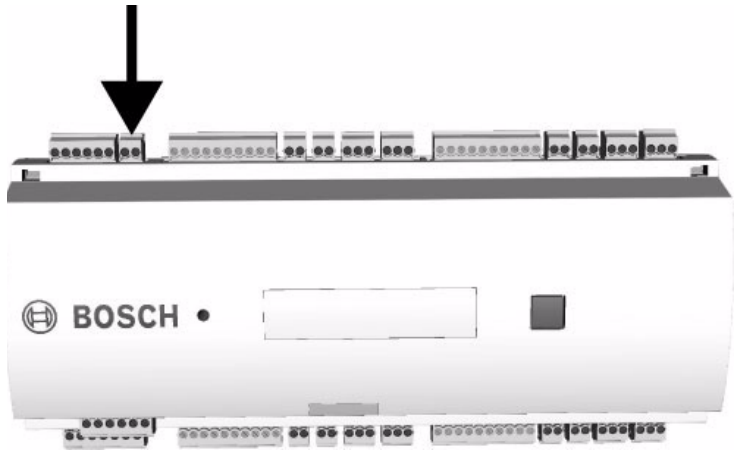


Fig. 5.24 Location of the tamper protection contact

6 Operating

6.1 Status Display of the AMC2 4W

The LC Display delivers information about the AMC2 4W status. Push the 'Dialog' button to switch between different modes.

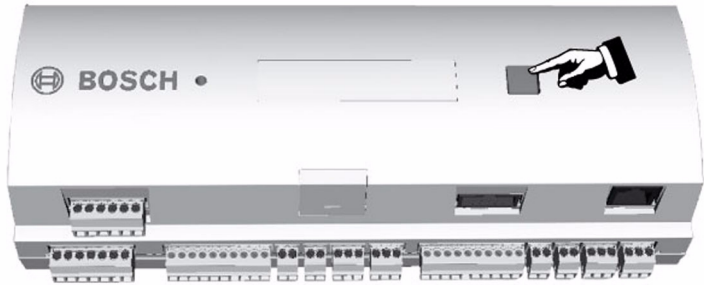


Fig. 6.1 Location of the 'Dialog' button

The display mode which has been set remains until the next operation of the 'Dialog' button. The order of the display pages is determined and follows the scheme shown in the table below.

Push	Display (Example)	Description
0	V37.02 02.03.06 or WIEGAND	Software versions and date of the downloader - every 5 sec. alternating with the display of the reader interface. (= default page)
1	99999876543210 A	BOSCH serial number and bus address: A = address 1 ... H = address 8
2	02.06 15:35:15	Current date and time
3	Dig. IO: ::::::::::::::	Display of the digital contacts: setted input signals will be shown with an extension above - output signal with an extension below
3a	Dig. I1: ::::::::::::::	If there are I/O-Boards connected the signals will be shown on separate pages.
3b	Dig. I2: ::::::::::::::	
3c	Dig. I3: ::::::::::::::	
4	MAC 0010174C8A0C	MAC-address
5	N AMC-1234-5678	Network name of the AMC
6	I 192.168.10.18	IP-address of the AMC
7	H 192.168.10.10	IP-address of the host computer
8	DHCP 1	DHCP-status: 1 = on 0 = off
9	D 192.168.10.1	IP-address of the DNS server
10	Host: + "C"	Host activity: + = online - = offline "C" = Counter of the received data packages from the host interface

Table 6.1 Display pages

6.2 Configuring the Ethernet Interface

To configure the AMC2 4W in a TCP/IP network environment use the tool **AmcIpConfig** provided in the following directory on the standalone or the remote server:

```
\\Runtime-drive:\MgtS\AccessEngine\AC\bin
```

This tool can be copied and used on every computer.



NOTE!

The usage of the software application to configure the AMC2 4W via Ethernet interface is described in the online help of the tool.

6.3 Resetting the AMC2 4W

When a problem occurs, first, try to fix the problem directly. If this does not solve the problem, resetting the AMC2 4W may help.

6.3.1 Resetting the Software

1. Insert the provided screwdriver into the hole as shown in the figure below.
2. Push the reset button for at least three seconds.
3. The AMC2 4W will be reset and reboots. You are back in the download program.

Now it is possible to reconfigure the AMC2 4W from the beginning.

If the problem still arises, please, call your local service.

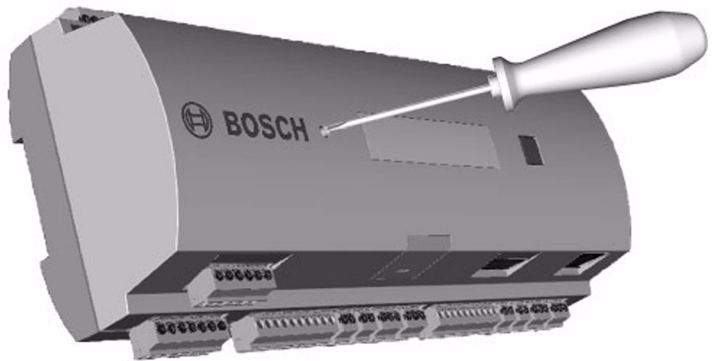


Fig. 6.2 Restarting the AMC2 4W with the provided screw driver

6.3.2 Resetting the Network Configurations

1. Reset the AMC2 4W as described above (in download program).
 2. Open the upper case of the AMC2 4W as described in *Section 5.3 Opening the AMC2 4W Case*.
 3. Set all six DIL switches of the RS-485 selector to **ON**
 4. Press the tamper switch on the upper left side of the board
- The AMC2 4W will now have the following network configuration:

- DHCP = 0
- IP = 127.0.0.1

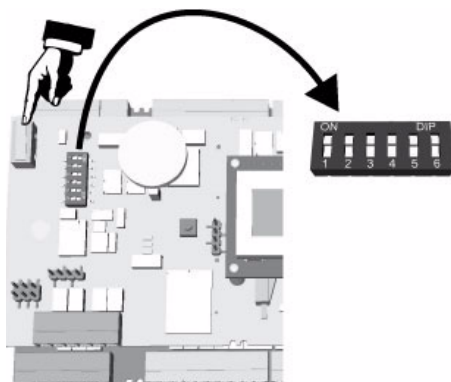


Fig. 6.3 Resetting the AMC2 4W to delivery state

7 Appendix

7.1 Connecting Diagrams

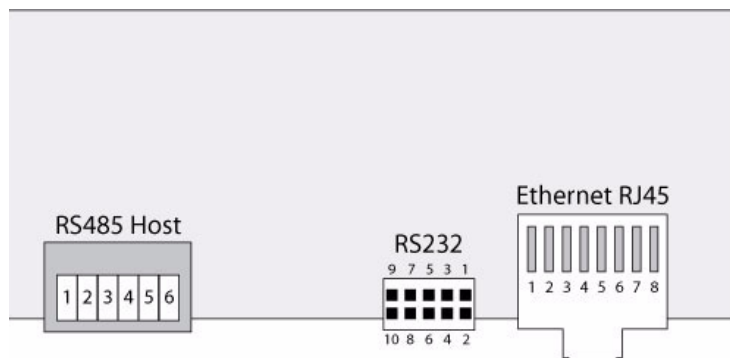


Fig. 7.1 Connectors on upper PCB

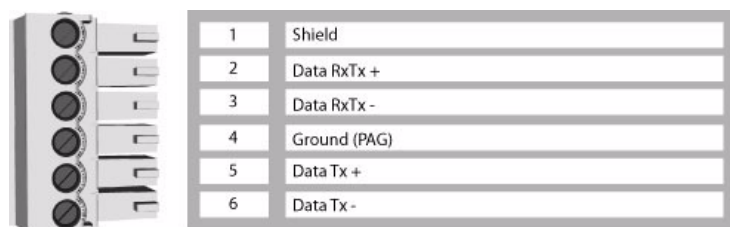


Fig. 7.2 RS-485 host on upper PCB

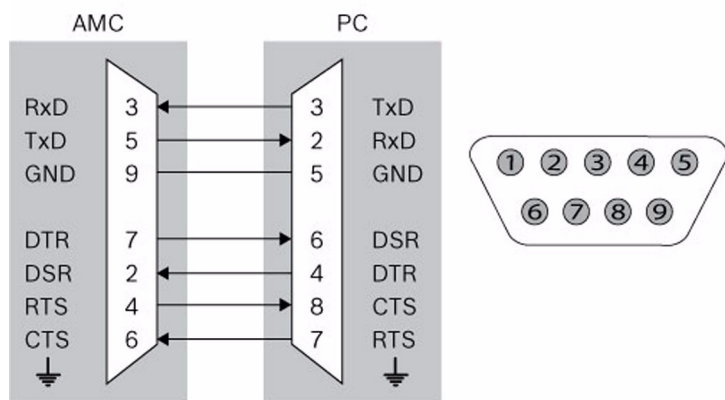


Fig. 7.3 Connecting diagram of the RS-232 serial interface

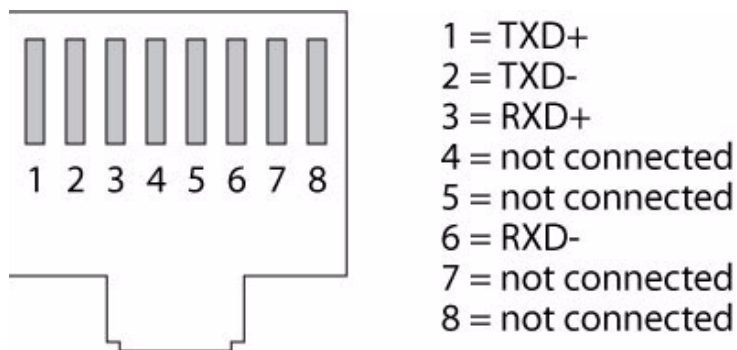


Fig. 7.4 Ethernet Network socket (RJ45)

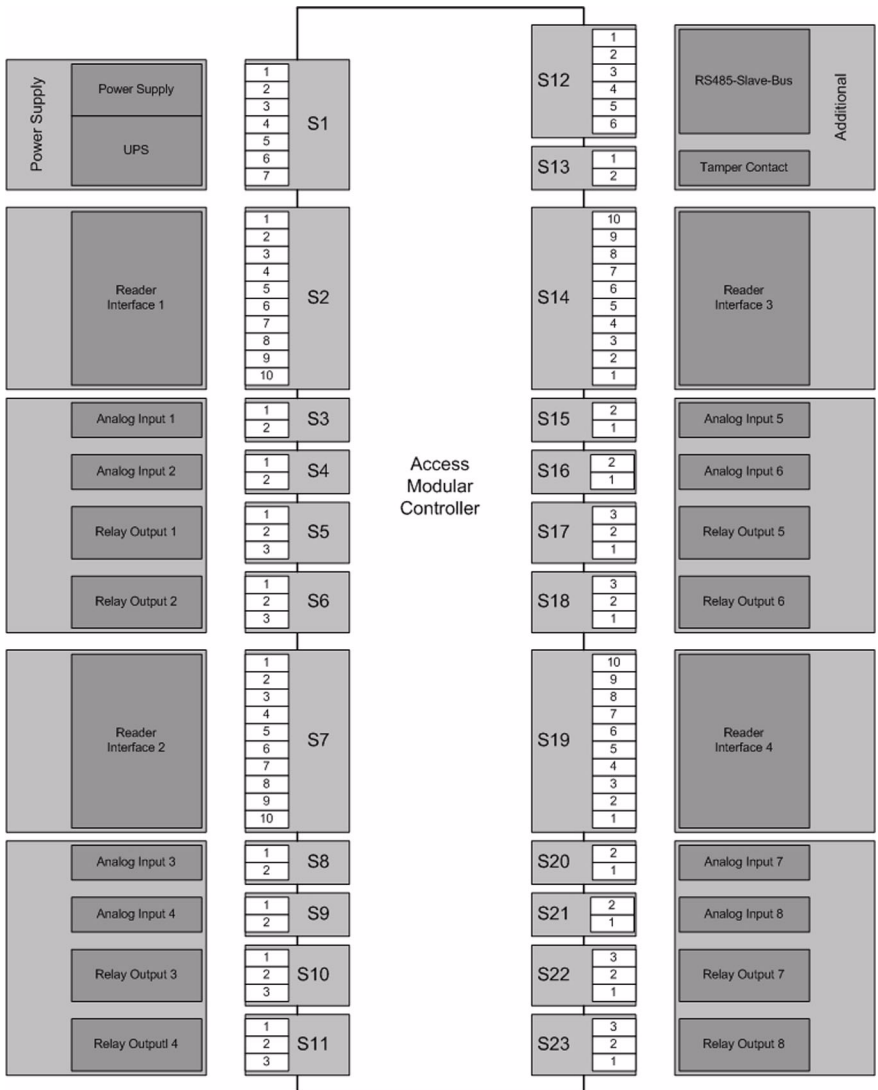


Fig. 7.5 Connector blocks of the AMC2 4W

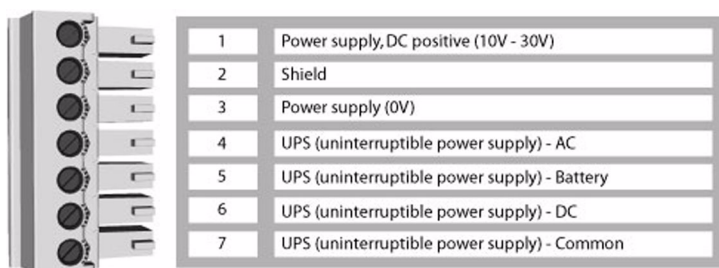


Fig. 7.6 Power supply

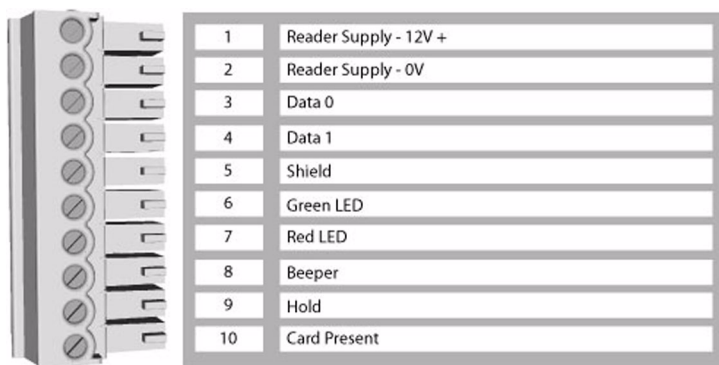


Fig. 7.7 Wiegand interface

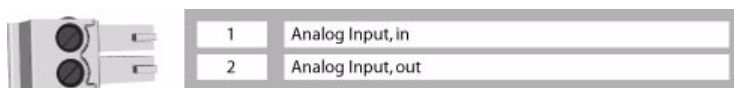


Fig. 7.8 Analog input

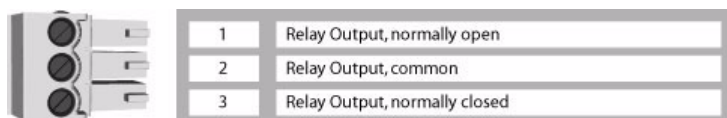


Fig. 7.9 Relay output

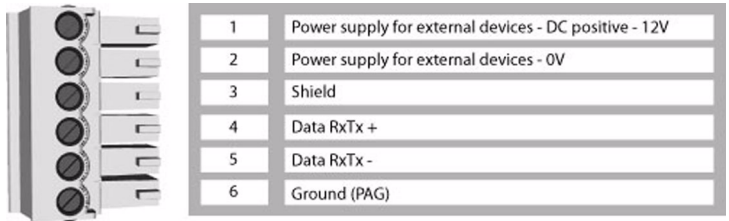


Fig. 7.10 Extension interface

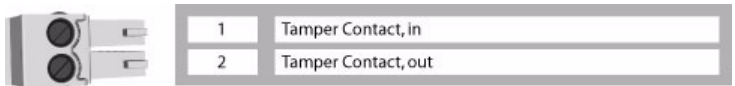


Fig. 7.11 External tamper contact

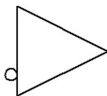
7.2 Legend



Twisted pair connection



Transmitter



Receiver

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